

COLORADO RIVER RECOVERY PROGRAM  
FY 99 ANNUAL PROJECT REPORT

RECOVERY PROGRAM  
PROJECT NUMBER: 22-A-2

I. Project Title: MONITORING THE COLORADO PIKEMINNOW POPULATION IN  
THE MAINSTEM COLORADO RIVER VIA PERIODIC POPULATION ESTIMATES

II. Principal Investigator(s):

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III. Project Summary:

The Interagency Standardized Monitoring Program (ISMP) was developed in 1986 to monitor population trends of Colorado pikeminnow and humpback chub in the Colorado River Basin using catch per effort (CPE) indices. ISMP was expanded in 1998 to include mark-recapture population estimates of the major Colorado pikeminnow and humpback chub populations. For Colorado pikeminnow, the original CPE data collection will continue and these data will be incorporated into those used to develop population estimates. This report summarizes the first and second year of work of a 3-year effort to develop new population estimates of Colorado pikeminnow in the Colorado River. Data collection efforts by the project biologist have been completed on schedule, all data has been entered and many analyses have already been run. The project concludes in 2001.

IV. Study Schedule: 1998-2001.

V. Relationship to RIPRAP:

Colorado River Action Plan: Colorado River Mainstem

V. Monitor populations and habitat and conduct research to support recovery actions.

V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.

VI. Accomplishment of FY 99 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Tasks

1. Capture and mark subadult and adult Colorado pikeminnow in the Colorado River (mid

April-mid June) for mark-recapture population estimates: this task was met.

*Background.*-- In 1996, a report was completed by Osmundson and Burnham (later published in 1998 in Transactions of the American Fisheries Society 127:957-970) outlining the current status and trend of the Colorado pikeminnow population in the Colorado River mainstem. The authors used a four-year mark-recapture effort to estimate the size of the subadult and adult population. Strong year classes in 1985 and 1986 recruited to the adult population during their 1991-1994 study, allowing the authors to document the large effect that a couple of strong year classes can have on adult population size. In the first year of the study (1991) most adults were found concentrated in the upper reach of the river (upstream of Westwater Canyon) and this population consisted of only about 200 individuals. By 1994, catch rates there had doubled. The 1994 point estimate for the upper reach was about 330 fish; though not double, it was substantially higher than that estimated three years prior. Also, an additional 300 or so young or soon-to-be adult fish were estimated to reside in the lower reach (downstream of Westwater Canyon). Thus, in four years the river-wide adult population increased from somewhere around 200-250 fish to around 600 fish.

In a 1997 report (later published in 1998 in Transactions of the American Fisheries Society 127:943-956), Osmundson et al. documented the dispersal of these young, recruiting adults in the lower reach and showed that many of these young fish moved to the upper reach. Based on body condition in the lower reach that declined as the fish grew and later improved upon arrival in the upper reach, along with differences in forage between the two reaches, the authors concluded that these upstream movements were related to an inadequate supply of food for adult pikeminnow in the lower reach.

*New information from 1998 and 1999.* -- In 1998, a second mark-recapture study was begun to monitor the status of this dynamic population - this time a three-year effort is being conducted instead of a four-year effort. In 1998 and 1999, the same protocol was used as before: three passes, or capture efforts, were made through the upper reach and two passes through the lower reach. With each pass, trammel-netting of backwaters and flooded canyon mouths was used to capture fish during the run-off period. Shoreline electrofishing was also used during periods when backwaters were not sufficiently flooded. Captures for the two years were as follows:

**1998**

Pass	Upper reach	Lower reach
1	32 fish	31 fish
2	67	65
3	43	--

**1999**

Pass	Upper reach	Lower reach
1	52	38
2	65	24

The new (1998 and 1999) population point estimates (using Program CAPTURE) and the means of the earlier four-year efforts are as follows:

	Upper reach	Lower reach	Total
1991-1994	253	344	597
1998	435	330	765
1999	367	401	768

Catch rates (fish per net) and mean body condition in the upper reach are also provided here to indicate year-to-year trends:

	Fish/net	Condition (kn)
1991	.324	101.0
1992	.487	97.7
1993	.619	97.6
1994	.686	98.8
1998	.966	92.9
1999	.777	93.5

In the upper reach, where most fish are adults, the population estimates and netting catch rates suggest that, beginning in 1992, adult numbers continued to increase, peaked in 1998, and then began to decline somewhat in 1999. Body condition was relatively stable during the 1991-1994 period but declined significantly by 1998 and 1999. A preliminary interpretation of declining condition concurrent with increased population size is that food is in short supply and that carrying capacity of the Colorado River may have been exceeded despite the fact that overall population size is small. If subsequent data collection and other studies bears this out, it will have important implications for the potential viability of this population and management activities will need to be directed toward increasing the extent of adult range and the food supply in this river so that this population has the capacity to expand to a more viable population size.

- VII. Recommendations: Finish this field effort in 2000 as planned and then begin another 3-year effort in 2004. With this schedule, averaged 3-yr population size estimates will be spaced 6 years apart. This should be sufficient to adequately monitor this population. Recommendations for management activities based on findings of this and previous studies include:

- 1) accelerate providing passage at Price-Stubb and Government Highline dams to increase the amount of adult habitat available to this population.
- 2) initiate a feasibility study for releasing warmer water from Aspinall Unit dams so that Gunnison River water near Delta is suitable for Colorado pikeminnow, with the ultimate goal of increasing the amount of adult habitat available to this population. This work should perhaps be included in the RIPRAP and 2001 Program Guidance.
- 3) implement 15-mile reach spring flow recommendations to increase the frequency of strong year classes of Colorado pikeminnow in the Colorado River.

VIII. Project Status: Project is ongoing and on-track. Field work is scheduled to continue through 2000 and report writing and completion in 2001.

IX. FY 99 Budget

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|------------------------|--------|
| A. Funds Provided:     | 44,000 |
| B. Funds Expended:     | 44,000 |
| C. Difference:         | 0      |
| D. N/A (BR projects)   |        |
| E. Publication Charges | 0      |

X. Status of Data Submission: Except for tagging-list data, the data collected during the 'population estimate' portions of the monitoring program are not due until the studies are completed. Tagging data collected for this project during 1998 has been submitted to the database manager; 1999 data will be submitted in January, 2000.

XI. Signed: Doug Osmundson, December 2, 1999.